Claims:

1. A steer-by-wire system for an automotive vehicle that includes road wheels, and a rack mechanically coupled to the road wheels and laterally displaceable to change the orientation of the road wheels, said steer-by-wire system comprising:

an electric motor coupled to the rack for laterally displacing the rack;

a road wheel sensor providing a signal indicative of road wheel response to a steering comand;

a controller; and

a driver interface subsystem comprising:

a steering wheel mounted on a steering column and rotatable by a driver for inputting a steering command;

a reaction torque generator coupled to the steering column for applying a resistive torque thereto in response to the steering command; and

an electromechanical brake operatively coupled to the steering column and selectively actuatable to prevent rotation of the steering wheel,

wherein the controller is coupled to the road wheel sensor for receiving the signal and for determining when the road wheel orientation has reached a limit based upon said signal, and coupled to the electromechanical brake for actuating said electromechanical brake in response thereto.

2. The steer-by-wire system of claim 1 wherein the limit corresponds to said road wheels engaging a stop mounted on the automotive vehicle.

3. The steer-by-wire system of claim 1 wherein the limit corresponds to a failure of the road wheels to change orientation in response to a steering command.

4. The steer-by-wire system of claim 1 wherein the electromechanical brake is a magnetorheological brake that includes a rotor that forms part of the steering column, and wherein the reaction torque generator comprises an electric motor coupled to the steering column through a belt and pulley mechanism.

5. The steer-by-wire system of claim 1 wherein the road wheel position sensor comprises means for detecting lateral displacement of the rack.

6. A steer-by-wire system for an automotive vehicle that includes road wheels, a rack mechanically coupled to the road wheels and laterally displaceable to alter the orientation of the road wheels, and stops disposed for engaging the wheels to limit the orientation thereof, said steer-by-wire system comprising:

an electric motor coupled to the rack for laterally displacing the rack;

a road wheel position sensor providing a signal indicative of said road wheels engaging said stop;

a controller; and

a driver interface subsystem comprising:

a steering wheel affixed to a steering column and rotatable by a driver for inputting a steering command;

a reaction torque generator coupled to the steering column for applying a resistive torque thereto in response to a steering command; and

a magnetorheological brake comprising a rotor operatively coupled to the steering column, an electrical coil applying an electromagnetic field about the rotor, and a magnetorheological fluid disposed about the rotor and responsive to an electromagnetic field applied by the electric coil to prevent rotation of the steering wheel, and

wherein a controller is coupled to the road wheel position sensor for receiving the signal and for determining when the road wheels have engaged said stops, and is coupled to the magnetorheological brake for applying electrical current to said electrical coil to actuate said magnetorheological brake in response to said road wheels engaging said stop.

7. The steer-by-wire system of claim 6 wherein the reaction torque generator comprises an electrical motor coupled to the steering column through a belt and pulley mechanism.

8. The steer-by-wire system of claim 6 wherein the sensor comprises means for detecting lateral displacement of the rack.

9. The steer-by-wire system of claim 6 wherein the sensor comprises means for detecting increased electrical load to the electric motor.

10. A method for operating a steer-by-wire system for an automotive vehicle comprising road wheels and a rack operatively coupled to the road wheels and laterally displaceable to change the orientation of the road wheels, said steer-by-

wire system comprising a steering wheel mounted on a steering column and rotatable by a driver for inputting a steering command, said method comprising:

actuating a reactive torque generator to apply a resistive torque in response to a steering command;

providing an electromechanical brake operatively coupled to the steering column;

determining the response of the road wheels to a steering command, and

actuating the electromechanical brake in response to a determination that the road wheel orientation has reached a limit to prevent rotation of the steering wheel.

11. A method in accordance with claim 10 wherein the electromechanical brake is a magnetorheological device.

12. A method in accordance with claim 10 wherein the electromechanical brake is actuated independent of the resistive torque applied by the reactive torque generator.

13. A method in accordance with claim 10 wherein the limit corresponds to the road wheels engaging stop mounted on the automotive vehicle.

14. A method in accordance with claim 10 wherein the step of determining when the road orientation has reached a limit comprises sensing lateral

displacement of the rack.

15. A method in accordance with claim 10 wherein the step of determining when the road wheel orientation has reached a limit comprises sensing an electrical load of an electric motor coupled to the rack.

16. A method in accordance with claim 10 further comprising actuating the electromechanical brake to provide resistive steering torque in the event of failure of the reactive torque generator.